als on 392 patients with verified diagnoses of lambliasis and opisthorchiasis. Thus, it testifies about its antiparasitic activity. The Karaganda pharmaceutical complex was constructed and put into operation on the basis of holding «Phytochemistry». The complex has capacity of 2 millions ampoules, 150 millions tablets, capsules and 2 millions soft dosage forms of original competitive phytopreparations.

A NEW SPIRO-SESQUITERPENOIDIC CHROMANDIONE FROM GUM AMMONIACUM WITH ACETYLCHOLINESTERASE INHIBITORY ACTIVITY

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Attempts to restore cholinergic function have been considered as a rational target to improve the symptoms of Alzheimer's disease. One therapeutic option is the use of AChE inhibitors which block this key enzyme in the breakdown of acetylcholine (1). During the last decade the use of herbal medicinal preprations in dementia therapy has been studied based on traditional medicine (2). Gum ammoniacum is a gum-resin from *Dorema ammoniacum* D. Don which has been used in Unani and Iranian traditional medicine for several indications. A previous study showed AChE inhibitory activity for a dichloromethane extract of this resin (3). The aim of this study was the isolation and characterization of active compounds from gum ammoniacum. Extraction of the resin was performed by sonification with dichloromethane. The extract was investigated by a respective colorimetric microplate assay and the active zones were identified via TLC bioautography. Then the active compounds were isolated using several chromatographic techniques such as vacuum liquid chromatography, column chromatography and counter current chromatography. The structures of the active components were characterized by different methods such as one and two-dimensional ^{1}H and ^{13}C NMR spectroscopy (COSY, TOCSY, HSQC, HMBC, NOESY) and mass spectrometry. Two spirosesquiterpenoidic chromadiones were characterized as active components and one of them is a new compound. Their IC_{50} values for AChE inhibitory activity were determined by microplate assay as 77 and 100 µg/ml. The extract was analyzed by HPLC to determine the concentration of active compounds in the extract.

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EFFECT OF MARJORAM POWDER (*ORIGANUMMAJORANA* L.) AS ANTIBIOTIC GROWTH PROMOTER SUBSTITUTIONS ON PERFORMANCE AND IMMUNITY OF BROILER CHICKS

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This experiment was conducted to evaluate the effect of marjoram powder (*Origanummajorana* L.) as an antibiotic growth promoter substitution on performance and immune responses in broiler chicks. Three hundred day-old broiler chicks were divided randomly into four treatment groups included: control (Basal diet), antibiotic (Flavophospholipol) and marjoram powder at levels of 2 and 4 g/kg in basal diet. Body weight, feed intake and feed conversion were recorded at 14, 28 and 46 d. Antibody titer against Newcastle and Avian Influenza (H9 N2) viruses at 26 d (14 d post immunization), SRBC at 32 d (6 d post immunization) and heterophil to lymphocyte ratio at 42 d were measured. Results showed that the birds fed the 2 or 4 g/kg marjoram powder had higher final body weight than other treatments ($P < 0.05$). Feed consumption in antibiotic group was significantly decreased. Feed conversion ratio was not affected by dietary treatments. Antibody titer against Newcastle and Influenza viruses were elevated in broiler chicks fed 4 g/kg marjoram powder ($P < 0.05$). Antibody titer against SRBC, albumin to globulin ratio and heterophil to lymphocyte ratio were not affected by dietary treatments. These results suggest that

addition of marjoram powder at level of 4 g/kg seemed to have a positive influence on growth performance and immune responses, and could be considered as a natural potential growth promoter for broiler chicks.

COMPARISON OF THE EFFECTS OF THYME AND OREGANO ON HEMATOLOGY IN LAYING JAPANESE QUAIL

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The aim of this study was to compare effects of oregano (*Mentha pulegiym)*, thyme (*Thymus)* on immune system in laying Japanese quail. 420 quails were feed in completely random design by 7 treatments and 4 replications (every replication involves 12 female and 3 male quails) by following ration for 45 days: 1) control diet (without thyme and oregano), 2)control diet+thyme 1.5 %, 3)control diet+thyme 3 %, 4)control diet+thyme 4.5 %, 5)control diet+oregano 1.5 %, 6)control diet+oregano 3 %, 7)control diet+oregano 4.5 %. At the end of the experiment, 2 birds were selected from each replication and the hematology measures were analyzed. The result showed that using different levels of oregano and thyme in quail diet were affected on hematology. Monocytes had the highest consumer 4.5 % oregano than control group (9.25 vs 6.5 %). Adding oregano until 4.5 % had significant effect on basophile, oezinophil and monocyte. Intake level of 4.5 % thyme observed highest level in basophile and oezinophil between groups (2.22 and 5.75 respectively). Containing 4.5 % oregano in group, suggests that differences in antioxidant and antioxidation properties, thyme and oregano. In conclusion, add thyme and oregano to the 4.5 % of the diet has significantly positive effect on the percentage of basophile, oezinophil and monocytes.

MULTI-BIOACTIVE METABOLITES FROM *RUDBECKIA HIRTA* L. FLOWERS

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Black-eyed Susan or *Rudbeckia hirta* L. (Asteraceae) is a popular garden biennial herb. American Indian used the root tea to treat worms and colds, and as a wash for sores and snakebites, while the root juice has been used to treat earache (1). The immunomodulatory organic extract of *R. hirta* flower heads was partitioned and subjected fractionation using a series of chromatographic techniques which led to the isolation of a new highly oxygenated pseudoguaianolide: (1S*,4S*,5R*,6R*, 7S*, 10S*,11S*)-4,14,15-tri-acetoxy-pseudoguaian-12-,6-olide along with three phenolic acids: β-resorcylic acid, (E)-p-coumaric acid, and (E)-caffeic acid; two phenolic esters: 3-O- (E)-caffeoylquinic acid and 3-O-(E)-coumaroylquinic acid methyl ester; a phenolic acid ether (Z)-p-coumaric acid-4-O-β-D-glucopyranoside; two flavonol glycosides: gossypitrin and quercetagitrin; three methylated flavonol glycosides: eupatolin, patulitrin, eupatolitin-3-O-β-D-glucopyranoside; and eupatolitin-3-methyl ether. The structure of the new sesquiterpene lactone 1 was established on the basis of extensive spectroscopic analyses, including 1D and 2D NMR. Most of isolated compounds exhibited antioxidant (oxygen radical absorbance capacity, ORAC), immunomodulatory, 5-lipoxygenase (5-LOX) inhibitory and cytotoxic activities at variable concentrations, which can be considered as a partial scientific evidence for the ethnopharmacological uses of the plant.

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